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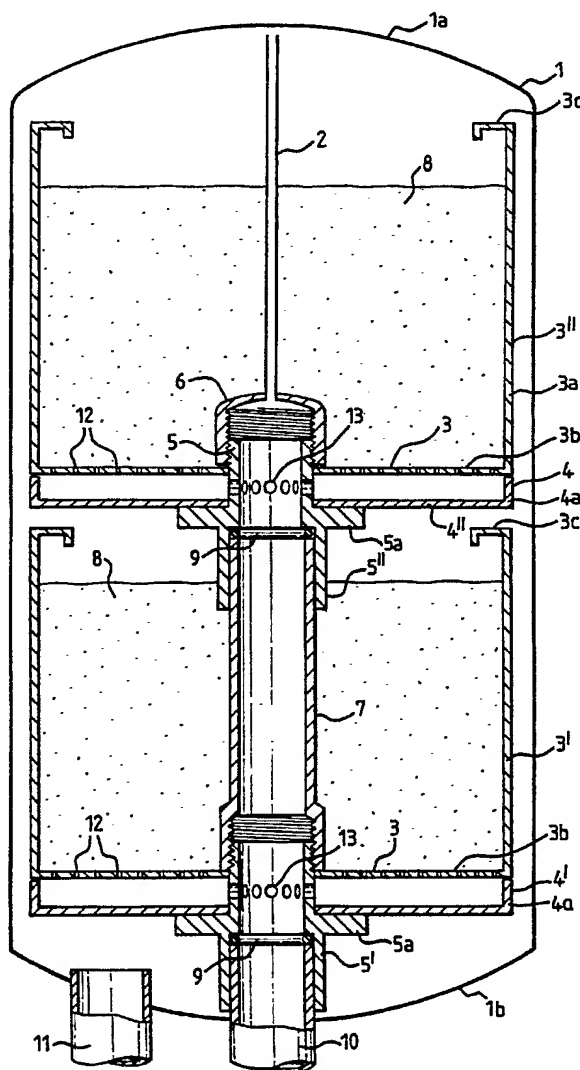
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GB 1511183 A GB 1287759 A US 3618774 A

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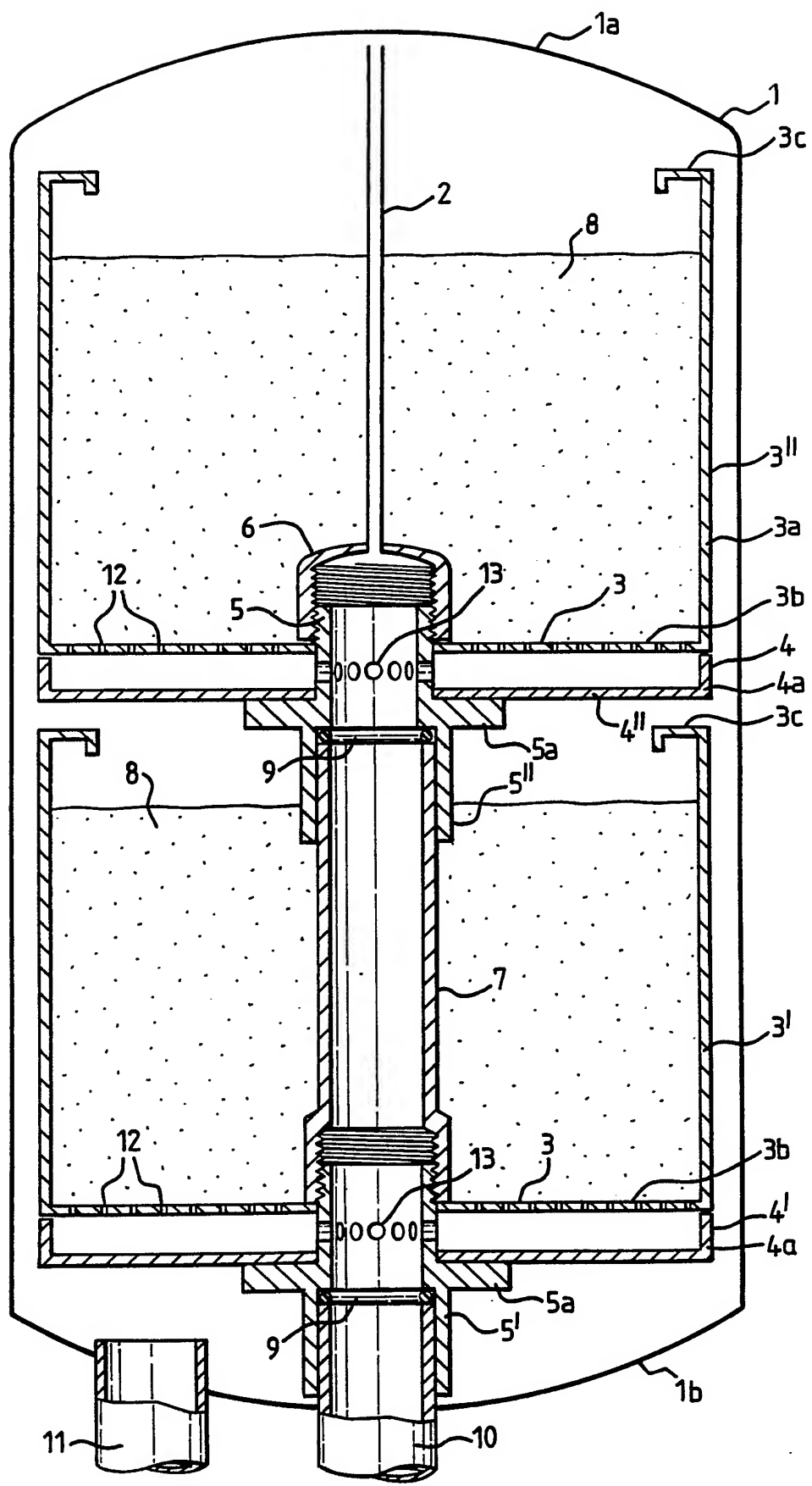
(54) Swimming pool filter

(57) A swimming pool filter comprises stacked cups 3 which hold beds of sand 8 or other filter medium. The cups 3 are housed in a drum 1 into which water is fed in under pressure through an inlet 11. Each cup 3 has a perforated base 3b, and the water flows down through the sand 8 and into a collector 4 whose peripheral wall engages the base. The water flows from collectors 4 through connecting sleeves 5 and 7 to an outlet 10. A vent pipe 2 vents air from the spaces between the bases 3b and collections 4. Each base 3b is perforated across its whole area to facilitate flow of water through the complete cross-section of the sand beds, avoiding dead spots.



GB 2 276 330 A

1/1



SWIMMING POOL FILTER

The present invention relates to a swimming pool filter.

GB-A-1376726 describes a tier filter system in which a plurality of sand beds are stacked spaced apart one above another in a stainless steel drum. The beds are formed by plastics cups or 'cheeses' having a drain in the form of slotted tubes positioned near the base of the cup. The tubes extend radially from a central collector pipe which connects the stacked cheeses and feeds to a water outlet at the base of the drum. Water is fed under pressure into the drum at the base and passes upwards between the cheeses and the drum wall and then flows downwards through the sand beds to the drains. To clean the filter, the water flow is reversed to fluidise the beds and wash out contaminants. An active filter medium may also be used.

The above described system has proved successful in reducing the space taken up by the filter, but there is a desire for a more efficient filter.

The present invention provides a swimming pool filter comprising a closed drum having a water inlet and

outlet, and a cup positioned within the drum for holding a filter medium, wherein the base of the cup is perforated to allow water to pass through the base of the cup and a collector is provided beneath the cup base to feed the water which passes through the cup base to the water outlet.

By providing perforations across the whole area of the base, water can be made to flow through substantially the whole cross-section of the sand bed near the base, thus avoiding the creation of dead spots which are a feature of the radial arms used in the prior art.

Preferably the cup has a flat base perforated across its area and the collector is in the form of a shallow tray having a rim which mates with the outer edge of the base to form an enclosed space. A drain pipe may be provided at the centre of the tray to feed water to the water outlet.

An upper end of the drain pipe is preferably vented to above the filter medium to allow air to escape easily from the collector as the filter is filled with water.

Other features and advantages of the invention will be apparent from the following description and the accompanying claims.

The invention will be further described by way of example with reference to the accompanying drawing which shows a cross-section of a swimming pool filter forming a preferred embodiment of the invention.

Referring to the drawing, a swimming pool filter comprises a stainless steel outer drum 1. The drum is cylindrical in cross-section and has domed upper and lower ends 1a, 1b. The drum may be formed by two deep drawn drum ends which are connected by a circumferential rib and clamp arrangement (not shown), as is well known in the art. For tall systems, a rolled cylindrical section is fitted between the ends.

A water inlet pipe 11 and an outlet pipe 10 are fixed to the lower end 1b.

Two polypropylene cups 3 are housed, one above the other, in the drum 1. Each cup has a cylindrical outer wall 3a which is spaced from the wall of the drum 1, and a flat base 3b which has perforations 12 distributed across its whole area. The perforations 12 are sized to prevent the passage of sand 8 held in the cup 3. If fine sand, or particularly large perforations are used then a coarser filter medium may be used in a layer above the perforations. Typically, the perforations are less than 0.3mm diameter.

Beneath the base 3b is a collector 4 in the form of a tray having a rim 4a which abuts the underside of the base 3b at its outer edge to form a seal. A tubular connecting sleeve 5 has a flange 5a which supports the tray 4 at its centre. The sleeve extends through the space between the tray 4 and cup base 3b and has apertures 13 to allow water in the tray 4 to drain into the sleeve 5.

The upper end of each sleeve 5 is threaded, and the sleeves 5 extend through the cup bases 3b which may be screwed onto the sleeve, or supported on a flange. The lower sleeve 5' is a close fit over the water inlet 10 at its lower end, and is screwed to a central drain tube 7 at its upper end. Drain tube 7 is in turn coupled at its upper end to the upper sleeve 5" which has a vent tube 2 screwed on its upper end. 'O' rings 9 form seals between the sleeves 5 and the outlet 10 and drain tube 7 respectively.

It can be seen that the sleeves 5 and drain tube 7 support the cups 3 and trays 4. Spacers (not shown) are provided below the outer periphery of the lower tray 4' to support it on the drum base 1b, and between the upper edge of the lower cup 3' and the upper tray 4". The upper edges of the cups 3 have a rim 3c for rigidity.

The filter is assembled by fitting the lower sleeve 5 and spacers in the drum base 1b and then the lower tray 4' and cup 7'. The drain tube 7 is then screwed into place. The lower tray 3 is filled with sand 8, or other filter medium if desired. The upper sleeve 5 is then fitted and spacers placed on the rim 3c of the lower cup 3'. The upper tray 4', cup 3' and bent tube 2 are then fitted and the upper cup filled with sand. The upper drum end 1a is then secured to the base 1b.

In use, water is fed under pressure (typically 1 to 2 bar) through the inlet 11. The water passes up the drum 1 around the outside of the cups 3 and flows into the cups 3 to pass down through the sand 8. The water passes through the perforated cup bases 3b into the trays 4, and so down through the sleeves 5 and tube 7 to the outlet 10. The spaces between the trays 4 and cups 3 are vented by the vent tube 2 so that the system readily fills with water. An air vent (not shown) is provided on the upper drum end 1a.

The fittings such as the trays 4, sleeves 5, tube 7 and vent 2 are preferably of plastics material such as polypropylene.

The prior art systems use a filter media (sand) depth of 250mm. With the present invention it is particularly preferred that a greater depth of sand be used,

preferably 400mm or more.

Various modifications may be made to the described embodiment and it is desired to include all such modifications as fall with the scope of the invention described herein.

CLAIMS:

1. A swimming pool filter comprising a closed drum having a water inlet and an outlet, and a cup positioned within the drum for holding a filter medium, wherein the base of the cup is perforated to allow water to pass through the base of the cup, and a collector is provided beneath the cup base to feed the water which passes through the cup base to the water outlet.
2. A swimming pool filter as claimed in claim 1, wherein the collector comprises a tray having a rim which forms a seal with the base.
3. A swimming pool filter as claimed in claim 2, wherein means is provided to vent air from the space between the tray and the cup.
4. A swimming pool filter as claimed in claim 1, 2 or 3, comprising a plurality of cups stacked one above another, the respective collector of an upper cup being spaced from the underneath cup.
5. A swimming pool filter substantially as hereinbefore described with reference to the accompanying drawing.

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Examiner's report to the Comptroller under
Section 17 (The Search Report)

- 8 -

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Relevant Technical fields

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(ii) Int Cl (Edition 5) B01D (24/10, 24/12) E04H 4/12

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASE: WPI

Search Examiner

R T HAINES

Date of Search

6 APRIL 1993

Documents considered relevant following a search in respect of claims 1-5

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 1511183 (BRITISH CECA CO)	1, 2, 4
X	GB 1287759 (FOWCADE)	1, 2, 4
X	US 3618774 (DELPHIA)	1

Category	Identity of document and relevant passages -9-	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

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ABSTRACT:

CHG DATE=19990617 STATUS=O> A swimming pool filter comprises stacked cups 3 which hold beds of sand 8 or other filter medium. The cups 3 are housed in a drum 1 into which water is fed in under pressure through an inlet 11. Each cup 3 has a perforated base

3b, and the water flows down through the sand 8 and into a collector 4 whose peripheral wall engages the base. The water flows from collectors 4 through connecting sleeves 5 and 7 to an outlet 10. A vent pipe 2 vents air from the spaces between the bases 3b and collections 4. Each base 3b is perforated across its whole area to facilitate flow of water through the complete cross-section of the sand beds, avoiding dead spots. □